Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at line 17 of page 7 has been amended as follows:

FIGS. 2J and 2K [2L] are circuit diagrams of multiple magnetically coupled control windings according to the topology of FIG. 2H used in embodiments of the present invention to provide higher resolution of control;

Paragraph beginning at line 19 of page 8 has been amended as follows:

FIGS. 3J and 3K [3L] are circuit diagrams of multiple magnetically coupled control windings according to the topology of FIG. 3H used in embodiments of the present invention to provide higher resolution of control;

Paragraph beginning at line 14 of page 9 has been amended as follows:

FIGS. 4J and 4K [4L] are circuit diagrams of multiple magnetically coupled control windings according to the topology of FIG. 4H used in embodiments of the present invention to provide higher resolution of control;

Paragraph beginning at line 10 of page 10 has been amended as follows:

FIGS. 6J and 6K [6L] are circuit diagrams of multiple magnetically coupled control windings according to the topology of FIG. 6H used in embodiments of the present invention to provide higher resolution of control;

Paragraph beginning at line 4 of page 29 has been amended as follows:

The alternate circuit configurations FIG. 2M, FIG. 2N and FIG. 2P for the auxiliary windings of FIG. 2H are included to illustrate the varied ways that auxiliary control windings may be configured and still be within the scope of embodiments of the present invention. All the auxiliary control windings in FIGS. 1A-1L, FIGS. 2A-2K [2L], FIGS. 3A-3K [3L], FIGS. 4A-4K, [4L] and FIGS. 6A-6K [6L],

may be configured alternatively as was done in FIG. 2M, FIG. 2N and FIG. 2P for the auxiliary control winding 226 in FIG. 2H as additional embodiments of the present invention.

Paragraph beginning at line 1 of page 43 has been amended as follows:

FIG. 7A is a block diagram of an induction generating system 780 employing a stand-alone self-excited induction generator 782, according to embodiments of the present invention, driving a variable electrical load 785. Self-excited induction generator 782 may employ any of the compatible auxiliary control windings and energy windings described in the embodiments of FIGS. 1A-1L, 2A-2K [2L], 2M-2N, 2P, 3A-3K [3L], 4A-4K [4L] and 6A-6K [6L] for auxiliary (AUX) windings 791 and three phase energy windings 798. The particular embodiment for energy windings 798 would depend on whether single phase or three phase energy windings were desired.

Paragraph beginning at line 4 of page 44 has been amended as follows:

A prime mover engine 781 is used to supply rotational mechanical energy to induction generator 782 via a shaft 789. The induction generator 782 has three phase outputs 786, however other combinations of phase outputs (1 or 2 phase) are possible without departing from the scope of the present invention. Induction generator 782 employs a single energy winding that may be configured either as a three phase Wye or Delta circuit. Likewise, induction generator 782 may employ one or more auxiliary control windings as described in the embodiments of FIGS. 1A[1K]-1L, 2A-2K [-2L], 2M-2N, 2P, 3A-3K [-3L], 4A-4K [-4L], 6A-6K [-6L]. Feedback signals load voltage 786 and load current 787 represent the currents and voltages of phases 786 driving variable electrical load 785. Signals 787 and 788 are coupled to controller 784. Controller 784 couples signals to switch elements (e.g., 248, 258 and 268) via control inputs (e.g., CN1 247, CN2 257 and CN3 267) to control the auxiliary windings of induction generator 782 in response to changes that occur in

variable load 785. Since controller 784 is electrical, it may operate on each electrical cycle of phase outputs 786. The engine control 783 is electro-mechanical and is slower to respond to changes in the voltage and current outputs (e.g., frequency, amplitude, phase, etc.) of induction generator 782. Depending on the characteristics of the variable electrical load 785, there are theoretical optimum capacitance values coupled to the auxiliary windings of induction generator 782 and control settings for engine 781. Induction generator 782 may be configured as described in FIGS. 1A-1L, 3A-3K [3L], and 6A-6K [6L]. Each of these configurations has a three phase energy winding and a three phase auxiliary winding.

Paragraph beginning at line 26 of page 44 has been amended as follows:

Engine 781 is coupled to induction generator 782 with shaft 789. If the rotor of induction generator 782 has some residual magnetism, then simply starting engine 781 and bringing it up to speed will start the process of establishing flux by induction in auxiliary windings 791. Embodiments of the present invention may use circuits in controller 784 to "pulse" the auxiliary windings with energy to start the excitation of auxiliary winding 791 if the voltages on auxiliary winding 791 do not establish once induction generator 782 rotation has commenced. For a particular design of induction generator 782, there will be a rotation speed for engine 781 necessary to determine the correct and desired frequency of the output on energy windings 786. Load switch 830 may keep the variable load 785 disconnected until induction generator 782 is brought up to an initial speed. Engine 781 may be started in a no load condition where variable load 785 is disconnected via load switch 830. Controller 784 may be designed to only begin controlling after the engine speed is within a range of its steady state value using an engine speed sense signal in signals 797. After the engine speed has stabilized, controller 784 would sense the current supplied to the load 785 and continually adjust the amount of auxiliary winding capacitance as a function of the load current 787and load voltage 788. If one did not have a control winding

corresponding to embodiments of the present invention, the induction generator may have to be sized so that the output voltage could be maintained strictly by controlling the speed of the engine 784 and a user may have to accept poor quality outputs 786 without optimization of auxiliary windings 791. Changing the capacitance on the auxiliary winding 791, according to embodiments of the present invention, optimizes the capacitance for a load 785 as it varies and thus the engine 781 is required to maintain a condition proportional to an optimized generator. Since the controller 784 electronically switches the capacitance quickly as the load changes, it optimizes the auxiliary (field) windings 791so the engine 781only has to change its speed based on a power requirement for a higher efficiency generator. The generator control loop, from outputs 786 through controller 784 (signals 788 and 787) and auxiliary windings 791 is a fast control loop, and the engine control loop from engine controller 783 to engine 781 is a slower control loop. The rotational inertia of the mechanical system ensures that the fast control loop can respond to a change in current and optimize the generator 782for a changing load 785 before the engine 781 either has to speed up or slow down to maintain the voltage for the changed load power requirement. The engine controller 783 would receive a new RPM set point, in one embodiment of the present invention, based on changing conditions of the load 785 determined by analyzing load voltage 788 and load current 787 via generator controller 784 and master controller 893. This is further described with respect to FIGS. 15 and16. Generator 782 may also have a single phase output (single phase output 786) [(e.g., embodiments of FIGS. 2A-2L and FIGS. 4A-4L)] without departing from the scope of the system embodiment in FIG. 7A.

Paragraph beginning at line 12 of page 51 has been amended as follows:

The induction system 800 employs an induction generator 806 which has two electrically and magnetically isolated energy windings 803 and 804 and an auxiliary windings 817 which are electrically isolated from both energy windings 803 and 804 but may be magnetically coupled to energy winding 804. The possible generator 806 embodiments are explained in the descriptions of FIGS. 3A-<u>3K</u> [3L] and 6A-<u>6K</u> [6L]. The induction generator 806 with the two isolated energy windings 803 and 804 along with an energy storage flywheel 814 allows multiple modes of operation which may be set by user inputs 918 to master controller 893. The modes of operation that are possible with system 800 are as follows:

Paragraph beginning at line 5 of page 54 has been amended as follows:

The induction system 900 uses induction generator 906 which has two electrically and magnetically isolated energy windings 903 and 904 and auxiliary windings 917 which are electrically isolated from both energy windings but may be magnetically coupled to energy winding 904. The possible generator 906 embodiments are explained in the descriptions of FIGS. 3A-<u>3K</u> [3L] and 6A-<u>6K</u> [6L]. The induction generator 906 with the two isolated energy windings 903 and 904 along with an energy backup inverter 914 powered by a battery source 919 allows multiple modes of operation which may be set by user inputs 918 to master controller 893. The modes of operation that are possible with system 900 are as follows:

Paragraph beginning at line 20 of page 56 has been amended as follows:

FIGS. 10A and 10B are circuit diagrams of analog and digital circuits which may be used according to embodiments of the present invention. FIG. 10A illustrates three phase energy winding 1007 which comprises branch energy windings 1009, 1008 and 1010. Loads 1004, 1005 and 1006 are coupled between terminals A11, B11 and C11 and node 1018 respectively. Three phase energy winding 1007 may be any one of the three phase winding configurations explained in embodiments of the

present invention (e.g., FIGS. 1A-1L, 3A-3K [3L] and 6A-6K [6L]). Current transformer 1003 is an analog component that may be used to sense the load current through load 1004. Other sense elements may also be used (e.g., a series sense resistor or Hall effect devices). The output of current transformer 1003 is coupled to an isolation and conditioning amplifier 1020 which generates a voltage VIL 1001 which is proportional to the load current in load 1004. Likewise, conditioning amplifier 1021 is used to sense the load voltage across load 1004 and generate a voltage VVL 1002 which is proportional to the load voltage across load 1004. Other embodiments of the present invention may sense all three phase load currents and voltages in the case the loads are unequal, in which case further processing of all three signals may be done to determine an appropriate feedback response.